Trend Study 28-14-03

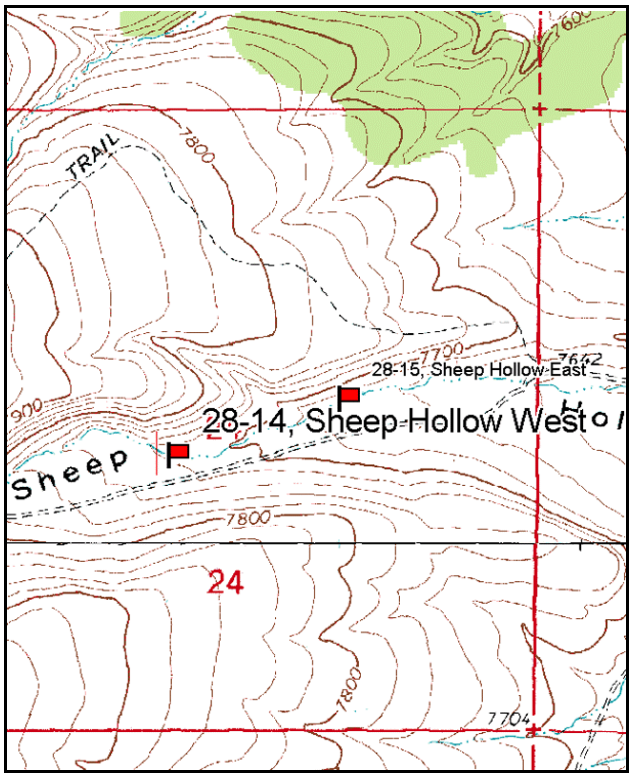
Study site name: Sheep Hollow West . Vegetation type: Black Sagebrush .

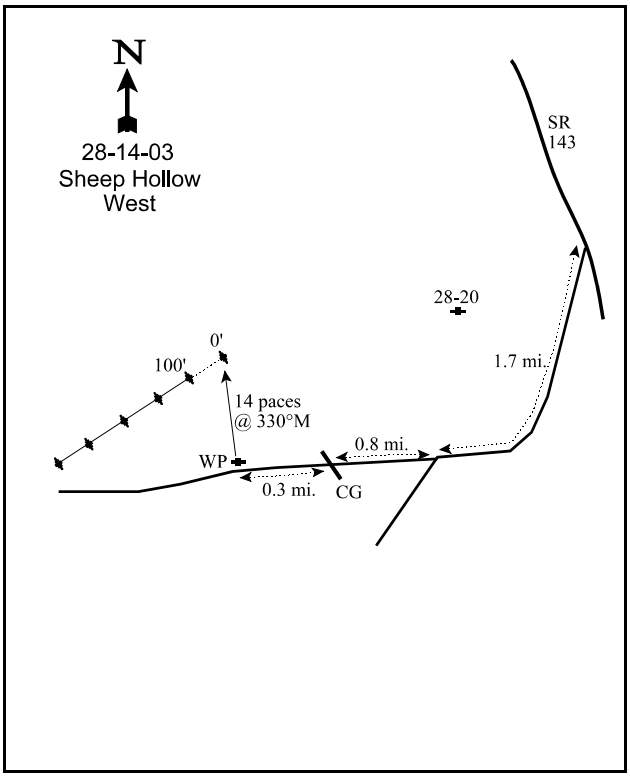
Compass bearing: frequency baseline 246 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft). Rebar: belt 4 on 1ft.

LOCATION DESCRIPTION

From Panguitch, head south on SR 143 to mile marker 47. Go 0.1 mile west of mile marker 47 and turn south onto a dirt road heading towards Sheep Hollow. Drive 1.7 miles to a fork. Stay right and continue 0.8 miles to a fence and cattleguard. Cross the cattleguard and go 0.3 miles to a witness post on the right side of the road. The 0-foot baseline stake is 14 paces from the witness post at 330 degrees magnetic. The 0-foot stake has browse tag #500 attached.





Map Name: Panguitch

Township 35S , Range 6W , Section 24

Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4179100 N, 369559 E

DISCUSSION

Sheep Hollow West - Study Site No. 28-14

This site was established in 1998 to monitor important winter range on the east side of the unit. Much of the winter range on this side of unit 28 is being effected by the encroachment of pinyon and juniper trees, and is represented by black sagebrush ridges with bitterbrush and big sagebrush in the deeper soils of the drainage bottoms. Big game animals, including pronghorn antelope, utilize these areas during most of the year and especially during the winter when deep snow pushes them to lower elevations. This site samples a wide drainage bottom which supports a dense population of black sagebrush with a good bitterbrush component. Slope is only 2-5% with a slight east aspect and an elevation of 7,800 feet. The area is used by a variety of wildlife and livestock. This area was historically a sheep range but use has been switched to cattle. The west side of the fence is permitted to be grazed by 296 AUM's from June to October (1998 grazing management information). The east side of the fence is grazed heavier and is monitored by trend study 28-15. Pellet group data collected in 1998 estimated 15 deer, 7 elk and 12 cow days use/acre (37 ddu/ha, 17 edu/ha, and 30 cdu/ha). Pellet group transect data from 2003 estimated 32 deer, less than 1 elk, and 7 cow days use/acre (79 ddu/ha, 2 edu/ha, and 18 cdu/ha). Deer and antelope pellets are difficult to differentiate and were lumped into deer pellets. Two dozen antelope were seen west of the site during study site establishment in 1998. Deer were also seen in the area.

Soil on the site is moderately deep with an effective rooting depth of 15 inches. Texture is a clay loam with a slightly acidic pH (6.3). Parent material is basalt. The soil profile is moderately rocky. Bare ground was moderately high in 1998 at 18%, increasing to 35% in 2003. Vegetation and litter cover were very abundant in 1998, with both decreasing in 2003 with drought conditions. An erosion condition class assessment in 2003 gave soils a slightly eroding rating due primarily to a gully in the road that was active and had dumped a lot of new soil on the site. Several categories in the assessment were given points including surface soil and litter movement, flow patterns, and moderately high pedestalling.

The site supports a dense stand of black sagebrush at an estimated density of 8,560 plants/acre in 1998 and 8,160 in 2003. Black sagebrush provides about 2/3 of the browse cover on the site in both 1998 and 2003, and canopy cover was estimated at 17% in 2003. The black sagebrush shows mostly moderate to heavy use with generally good vigor, but moderate decadence at 39% in 1998 and 34% in 2003. The proportion of the decadent age class classified as dying was low in 1998 at 7%, but increased to 42% in 2003. This translates into ~1,160 plants/acre that may be lost to die-off. Recruitment by young plants was not high enough in 2003 to replace the dying in the population, and it is likely that black sagebrush will decline in overall density by the next reading. Black sagebrush leaders had averaged just under 1 inch of annual growth when the site was read in late June 2003. Bitterbrush also provides important forage and has an estimated population density of about 500 plants/acre. These plants show moderate to heavy use. Decadence and poor vigor were very low in 1998, but both parameters increased in 2003. Recruitment by young bitterbrush plants was good in 1998 at 15%, decreasing to 4% in 2003. Bitterbrush leaders had averaged 1.6 inches of growth when the site was read in late June 2003.

Other browse encountered on the site include several rabbitbrush species (dwarf rabbitbrush, stickyleaf low rabbitbrush, and Parry rabbitbrush), broom snakeweed, and isolated patches of basin big sagebrush. Pinyon and juniper tree density was estimated at 10 to 15 trees/acre in 1998. These were hand cut prior to the 1998 reading as part of a tree thinning treatment. Only a few scattered young trees were left.

The herbaceous understory is diverse and abundant considering the high amount of shrub cover. Grasses dominate the herbaceous cover with 14 perennial species being sampled between 1998 and 2003. The most common species are mutton bluegrass and Letterman needlegrass which together produced over half of the total grass cover in both surveys. Less abundant perennials include western wheatgrass, blue grama, prairie

junegrass, bottlebrush squirreltail, and needle-and-thread grass. Forbs are also diverse. Eighteen perennial and 2 annual species were sampled in 1998. With drier conditions in 2003, only 8 perennial and 3 annual species were sampled. The most common species in 1998 included Indian paintbrush, Eaton fleabane, sulfur and redroot eriogonum, Lewis flax, and Utah deervetch. These species provide important succulent spring forage for big game animals.

1998 APPARENT TREND ASSESSMENT

Trend for soil appears stable with adequate protective ground cover to prevent erosion. Trend for browse appears stable with a relatively high turnover for black sagebrush. There is a high number of dead plants, but reproduction appears adequate to maintain the population at this time. Use is mostly moderate and vigor is good. Bitterbrush on the site also appear stable. Utilization is moderate to heavy, yet vigor is good on all plants and percent decadence is low at only 4%. The herbaceous understory is abundant and very diverse providing a total of 21% cover. Currently, mutton bluegrass and Letterman needlegrass dominate the grass component. Several preferred forbs occur on the site and provide important spring forage for big game.

2003 TREND ASSESSMENT

Trend for soil is down. A gully that parallels the road was active in 2003 and soil deposition onto the study site was apparent. As a result, bare ground nearly doubled. Vegetation and litter cover declined due to soil deposition onto the site as well as drought conditions. Trend for browse is slightly down. Black sagebrush had improved decadence but 42% of the decadent plants were classified as dying, an increase from 7% in 1998. The number of young in the population is not enough to replace these individuals. Basin big sagebrush density increased, but 43% of the population is decadent and no young were sampled in 2003. Bitterbrush slightly declined in overall density, and showed increases in both decadence and poor vigor. The number of young bitterbrush also declined. Trend for the herbaceous understory is down. Nested frequency values for most perennial species declined in 2003 with drought conditions. Perennial forbs showed a 59% decline in sum of nested frequency, while the frequency of perennial grasses declined by 20%.

TREND ASSESSMENT
soil - down (1)
browse - slightly down (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 28 , Study no: 14

Type	Species	Nested Frequency '98	Nested Frequency '03	Average Cover % '98	Average Cover % '03
G	Agropyron intermedium	-	8	-	.08
G	Agropyron smithii	3	4	.00	.03
G	Agropyron spicatum	6	-	.03	-
G	Agropyron trachycaulum	4	3	.03	.03
G	Bouteloua gracilis	4	7	.03	.06
G	Bromus inermis	5	-	.03	-
G	Bromus tectorum (a)	-	4	-	.01
G	Carex spp.	[b]21	[a]-	.63	-

Type	Species	Nested Frequency '98	Nested Frequency '03	Average Cover % '98	Average Cover % '03
G	Koeleria cristata	$_{a}$27	$_{b}$64	.44	1.48
G	Oryzopsis hymenoides	2	4	.03	.15
G	Poa fendleriana	$_{b}$232	$_{a}$186	8.61	4.21
G	Sitanion hystrix	74	71	.97	.90
G	Stipa columbiana	8	-	.19	-
G	Stipa comata	12	13	.10	.35
G	Stipa lettermani	$_{b}$183	$_{a}$102	4.86	1.08
Total for Annual Grasses		0	4	0	0.00
Total for Perennial Grasses		581	462	15.97	8.39
Total for Grasses		581	466	15.97	8.40
F	Antennaria rosea	16	9	.36	.01
F	Arabis spp.	1	-	.01	-
F	Astragalus convallarius	$_{b}$8	$_{a}$-	.21	-
F	Astragalus spp.	3	-	.00	-
F	Castilleja linariaefolia	$_{b}$49	$_{a}$2	1.24	.03
F	Chenopodium leptophyllum(a)	$_{a}$-	$_{b}$15	-	.09
F	Erigeron eatonii	$_{b}$63	$_{a}$5	.59	.03
F	Erigeron flagellaris	9	-	.07	-
F	Erigeron pumilus	$_{b}$25	$_{a}$-	.04	-
F	Eriogonum racemosum	55	54	.45	.50
F	Eriogonum umbellatum	$_{b}$46	$_{a}$33	.79	.61
F	Gayophytum ramosissimum(a)	$_{a}$-	$_{b}$87	-	.43
F	Hymenoxys richardsonii	1	-	.03	-
F	Linum lewisii	$_{b}$46	$_{a}$14	.25	.05
F	Lotus utahensis	$_{b}$35	$_{a}$-	.42	-
F	Lupinus kingii (a)	4	-	.03	-
F	Lychnis drummondii	7	-	.01	-
F	Machaeranthera canescens	5	-	.06	-
F	Penstemon caespitosus	3	-	.03	-
F	Penstemon spp.	3	4	.00	.01
F	Phlox longifolia	58	56	.17	.19
F	Polygonum douglasii (a)	11	5	.02	.01
Total for Annual Forbs		15	107	0.05	0.53
Total for Perennial Forbs		433	177	4.79	1.45
Total for Forbs		448	284	4.84	1.99

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 28 , Study no: 14

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia nova	95	98	13.73	17.06
B	Artemisia tridentata tridentata	2	12	-	.36
B	Chrysothamnus depressus	10	12	.40	.12
B	Chrysothamnus parryi	0	1	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	54	66	2.79	4.17
B	Gutierrezia sarothrae	3	8	.21	.31
B	Opuntia spp.	1	2	-	-
B	Purshia tridentata	23	21	4.41	3.42
Total for Browse		188	220	21.54	25.46

CANOPY COVER, LINE INTERCEPT --
Management unit 28 , Study no: 14

Species	Percent Cover '03
Artemisia nova	16.66
Chrysothamnus depressus	.11
Chrysothamnus viscidiflorus viscidiflorus	1.86
Gutierrezia sarothrae	.05
Purshia tridentata	3.45

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 28 , Study no: 14

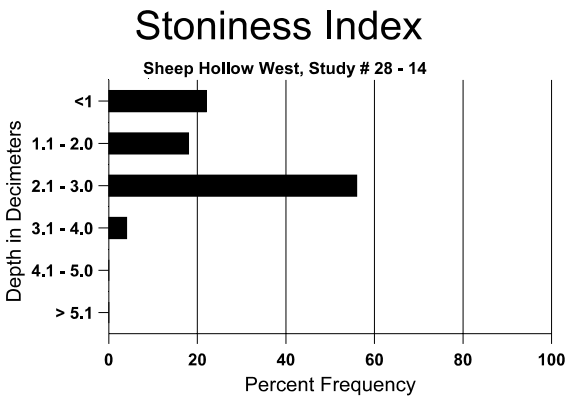
Species	Average leader growth (in) '03
Artemisia nova	0.9
Purshia tridentata	1.6

BASIC COVER --
Management unit 28 , Study no: 14

Cover Type	Average Cover %	
	'98	'03
Vegetation	51.18	35.06
Rock	5.71	5.79
Pavement	6.77	3.70
Litter	39.84	34.54
Cryptogams	3.50	1.47
Bare Ground	18.07	35.31

SOIL ANALYSIS DATA --
Management unit 28, Study no: 14, Study Name: Sheep Hollow West

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
15.0	57.3 (14.3)	6.3	40.7	27.4	31.8	2.2	18.4	131.2	0.3



PELLET GROUP DATA --
Management unit 28 , Study no: 14

Type	Quadrat Frequency	
	'98	'03
Rabbit	6	2
Elk	5	2
Deer	11	11
Cattle	1	3

Days use per acre (ha)	
'98	'03
-	-
7 (17)	1 (2)
15 (37)	32 (79)
12 (30)	7 (18)

BROWSE CHARACTERISTICS --
Management unit 28 , Study no: 14

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia nova											
98	**8560**	380	580	4680	3300	1560	43	13	39	3	16/22
03	**8160**	-	400	4980	2780	2320	25	1	34	14	15/20
Artemisia tridentata tridentata											
98	**60**	-	20	40	-	-	0	33	0	0	-/-
03	**560**	-	-	320	240	40	18	0	43	21	20/26
Chrysothamnus depressus											
98	**240**	20	40	200	-	-	0	0	0	0	7/10
03	**340**	-	20	280	40	-	71	12	12	0	5/9
Chrysothamnus parryi											
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	20	-	-	-	0	0	-	0	7/9
Chrysothamnus viscidiflorus viscidiflorus											
98	**2740**	-	320	2420	-	-	0	0	0	0	8/12
03	**4120**	-	200	3820	100	-	0	0	2	.48	7/12
Gutierrezia sarothrae											
98	**80**	-	-	80	-	-	0	0	-	0	6/8
03	**260**	-	-	260	-	-	0	0	-	0	7/6
Opuntia spp.											
98	**20**	-	-	20	-	-	0	0	-	0	7/12
03	**40**	-	-	40	-	-	0	0	-	0	6/12
Purshia tridentata											
98	**540**	-	80	440	20	-	59	19	4	0	23/36
03	**480**	-	20	280	180	40	71	29	38	21	30/45